

**EXHIBIT 10**

**September 13, 1994 Montana Memo Re Recommendation For Partial  
Bond Release at W.R. Grace**

## DEPARTMENT OF STATE LANDS



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MEMORANDUM

TO: WR Grace File, Operating Permit 00010

FROM: Patrick Plantenberg / *RP* Reclamation Specialist

RE: Recommendation for Partial Bond Release at WR Grace

I have completed my review of WR Grace's Application for partial bond release. Outlined below are my observations of reclamation success for partial bond release.

Slope Stability Issues

The presence of vermiculite in the mine waste dumps results in an increased potential for slope instability because of the platy nature of the mineral. Failures have occurred in the past on the Carney Creek dump. These failures resulted from settling of dump materials over time and subsequent inflows of water from roads into the settling cracks. Since mine shutdown, increased runoff control measures have been initiated and additional settling has not occurred. However, logging of surrounding undisturbed slopes in similar geology have also produced landslides. Therefore, minor failures of this sort can be expected in the reclaimed area regardless of planning and implementation of specific reclamation plans. Impacts of such slumps would be comparable to such slides off site.

Periodic minor slumps can be expected to occur in the future within the dump, especially in the spring when waste rock dump materials would be the wettest. The slides in the past have blocked Carney Creek and resulted in pond formation behind the mine waste materials. This pond now captures all erosion and sediment from mine areas above the pond, and prevents any impacts to Rainy Creek.

An additional sediment control pond is an historic structure constructed in lower Carney Creek above the confluence with Rainy Creek to control sediment loss from erosion of native materials as the creek was forced to cut a new channel around the landslide. WR Grace is scheduled to clean out this sediment pond in the fall of 1994. The Water Quality Division will be responsible for monitoring this pond in the future as part of their

review of water quality monitoring of the site under the Water Quality Act.

For the short term water quality impacts to Carney and Rainey Creeks could occur from future slides in the Carney Creek area. As the reclamation ages, the potential for impacts would decrease. DSL will retain monies for erosion control and surface water management until the site matures. The potential for future slides is also reduced as reclamation plant communities begin to dry out the mine waste rock dumps and add additional stability in the form of plant root systems.

#### Reclamation Issues

Soils were not salvaged as part of the original approved mine plan in the early 1970's. Soil salvage and replacement would have enhanced the rate of reclamation success. However, soil profiles will regenerate naturally as reclaimed areas age.

The geologic materials at WR Grace are essentially inert and do not have the potential to produce acid. In fact, vermiculite is often used as an additive to potting soil. However, the geologic materials are serpentine and inherently infertile. In addition, minor problems with Ca and Mg imbalances can occur. As a result, WR Grace has periodically fertilized.

Precipitation in the permit area ranges up to 40 inches per year. Reclamation seedings have produced substantial stands of grass as long as fertilizer nutrients were supplied and until available moisture declined in the root zone to the lack of water holding capacity in the geologic materials. Legumes in the seed mix have grown the best because of their ability to produce their own nitrogen. No fertilizer was applied in 1994. In this region, it is typical for plant growth to be adequate until rains stop. This pattern is exaggerated in the permit area because of limited moisture holding capacity. Continued long term fertilization is not necessary, unless the landowner wants to speed reclamation success for post-mine land uses.

Grazing by elk and browsing by deer and moose continue on the reclaimed areas, especially on the impoundment. This indicates the ability of the site to achieve the post mine land use.

Old tailings deposited in Rainy Creek from 1920-1971 are completely revegetated. Old coarse tailings below the old mill and above the tailings impoundment have revegetated and are supporting a healthy stand of conifers. No erosion or landslides in the naturally reclaimed sites have been observed.

## Conclusions/Recommendations

The reclaimed site will continue to increase in productivity and diversity at a slow steady rate, limited only by the rate of soil development, fertility, and soil moisture storage capacity. As soils develop, plant communities will be more diverse and productive. Eventually the tailings impoundment would likely establish a spruce/wetland habitat type. The post mining land use (wildlife habitat) has been achieved and the mine area will continue to be used extensively by wildlife as long as hunting is controlled. Eventually the grasses, legumes and shrubs on the mine site will be replaced by conifers and wildlife habitat use would change from a grazing/browsing area to a timber stand used by wildlife for grazing/browsing and security cover similar to the surrounding dense stands of timber.

The postmine topography, vegetation and sediment control measures are effectively limiting sedimentation and release of asbestosiform minerals in Rainey and Carney Creeks to background 1971 levels. Due to the nature of the orebody, no release of metals or acid would occur. Creek flows have been restored to background levels through the impoundment area. Historic water quality issues in the impoundment area are being addressed separately by Water Quality Division.

Therefore, I have determined that, although the reclamation plan of WR Grace was developed in 1972, effective reclamation has been performed and comparable stability and utility is being achieved. Partial bond release is warranted.